

77  
887

# ANNUAL REPORT

BY THE

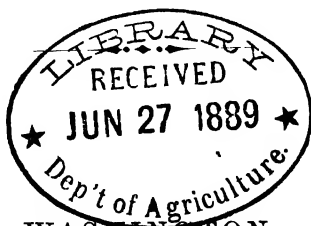
## POMOLOGIST

H. E. Van Dine

OF THE

### UNITED STATES DEPARTMENT OF AGRICULTURE.

1887.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1888.

# ANNUAL REPORT

BY THE

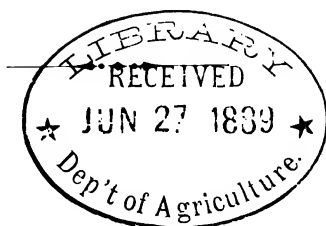
## POMOLOGIST

OF THE

UNITED STATES DEPARTMENT OF AGRICULTURE.

---

1887.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1888.

## REPORT OF THE POMOLOGIST.

---

SIR : I have the honor of submitting to you my second annual report as chief of the Division of Pomology, and hope it may be received by yourself and by the public with due allowance for the limited funds and clerical assistance at my command.

It is my aim to serve the cause of practical and scientific pomology in such a way as to accomplish at least a part of the good you and many others had in mind when the division was established.

The year 1887 may really be said to be the first in which I have had opportunity to get the machinery of this division into good working order.

On the 1st day of February of this year Mr. Charles L. Hopkins, of Florida, was appointed as clerk to assist me, and on August 1 Mr. William H. Prestele, of Iowa, was appointed as artist of this division.

The very small appropriation of \$3,000 for the fiscal year beginning July 1, 1887 (the same amount as for the previous year), did not permit me to undertake any very large work, especially as the salaries of these two persons and all other expenses of the division had to be paid out of it. The steadily increasing correspondence of the office has been a heavy burden.

Up to August 1, when Mr. Prestele took his place here, there was no one to make drawings of the fruits which were being daily received for study and comparison, except myself, and I had neither sufficient time nor proper skill to devote to it. Prior to that time I was only able to make pencil drawings of the more important varieties received, and a careful record and minute description of them ; but since then a part of the drawings have been made in India ink, and others have been reproduced in water-colors, all in the most skillful manner, showing the natural size, shape, and color of both exterior and interior of the fruit, with the leaves and twigs characteristic of each. These are invaluable for comparison and reference, and a portion for publication.

A photographic apparatus has been purchased, which will be used to take views of such trees, orchards, vineyards, or other subjects as it may be necessary to preserve, or present in published form in the reports.

A compound microscope of high power, together with necessary appliances to be used in connection therewith, have been secured for the use of the division. Also a very good microtome has been purchased with which to make sections for microscopical study. It is my desire to make use of every possible means to investigate and study the complex questions of a pomological character, or such as are directly connected therewith, as they may arise. For instance, the pollen of different botanical species and of the varieties of each species should be examined, and their physiological characters and

differences well understood. This is very important in the study of the scientific principles which underlie practical pomology.

In accordance with your directions, there have been prepared for publication within the present year the following manuscripts: By Mr. P. W. Reasoner, of Manatee, Fla., a report on "The Condition of Tropical and Semi-Tropical Fruits in Florida and the Gulf States;" by Mr. W. G. Klee, of Berkeley, Cal., a report on "The Condition of Tropical and Semi-Tropical Fruits in California, Arizona, and New Mexico." These two reports, together with a few notes by myself upon the same general subject, and colored illustrations of Japanese plums and persimmons, constitute Bulletin No. 1, of the Division of Pomology. It has been in the hands of the Public Printer since December 1. Also, by Mr. T. T. Lyon, of South Haven, Mich., a report on "The Adaptation of Russian and Other Fruits to the Extreme North and Northwest Portions of the United States." This report is also in the hands of the Public Printer and will be issued as Bulletin No. 2. It was my desire to have both of the above-named bulletins issued promptly, and it is to be regretted that the want of sufficient appropriations should have delayed their publication.

An article was prepared by W. H. Ragan, of Greencastle, Ind., entitled "Our Fruits, Native and Introduced," which gives information of a character that should be issued by this Department, and it is now awaiting publication.

A monograph has been prepared by T. V. Munson, of Denison, Tex., entitled "The Native Grapes of the United States." This is a scientific treatise of an unusually valuable and interesting character, and should be published with illustrations in colors, showing a portion of the branch, leaves, fruit, flowers, and seeds of each of the twenty-one species native to this country. A part of the original illustrations to accompany the text have already been prepared, and it is my purpose that the artist, Mr. Prestele, shall prepare, during the next fruiting season, an accurate, typical, and life-size water-color painting of each species, with a view to the whole being published in the highest style of art. Certainly this subject is one that deserves to be placed before our people in the most lucid manner possible. It is my earnest desire that within the next year this matter shall receive the favorable and necessary action of Congress to enable this work to be done.

#### THE APPLE.

The condition of this, the most important of all our fruits, during the year 1887, was somewhat peculiar. In the States of Ohio, Indiana, Illinois, and parts of several adjoining States, where apples are usually very abundant, the crop was almost a total failure. In Connecticut it was very heavy, and in western New York, and most of the New England States and parts of Michigan, there was a plentiful supply. The northwestern part of the southern peninsula of Michigan, which is commonly called the "Grand Traverse Region," produced a large crop for the amount of orchards planted. The climate there seems peculiarly well adapted to the growing of apples, and especially late keepers. The samples grown there were the very last to disappear in this office, which was about the 1st of June. Missouri, Kansas, northern Arkansas, Kentucky, Tennessee, and western North Carolina had about half a crop in some localities, the fruit, in size and quality, not being up to the standard, because of the unusual drought which prevailed.

Very good keeping apples were sent me from Tennessee and Mississippi, and summer apples of very fair quality were received from Louisiana.

In the region embraced by Minnesota, Wisconsin, Iowa, Dakota, and northern Nebraska the successful culture of the apple has been almost despaired of by some, owing to the ruinous effects of the remarkably severe winters of the past few years. Others are as hopeful as ever, and are replanting their orchards in firm belief that they will gather abundant crops from them.

Some depend on Russian varieties imported by this Department in 1870 and those brought over at later dates by other parties; notably among these Prof. J. L. Budd, of Iowa Agricultural College. Others place but little dependence on these Russian varieties because of the poor quality, the early ripening of their fruit, and their peculiar susceptibility to the attacks of blight. Many of those most sanguine of success are looking to a race of new seedlings, which shall be the result of crosses between the best apples known and either the hardiest Russian varieties or crabs. It is thought the good qualities of the fruit of the former and the hardy constitution of tree in the latter may be blended in the coming generation. Tedious and painstaking efforts are being made in this direction, especially in Iowa, Wisconsin, and Minnesota.

Feeling the importance of the subject, and with a view of learning just what is the real condition of the fruits of this territory, Mr. T. T. Lyon, of South Haven, Mich., who is a pomologist of eminence and entirely disinterested motives, was commissioned, under the supervision of this division, to carefully examine and report thereon.

On the Pacific slope the apple crop was fairly good. Oregon and Washington Territory produce apples of remarkably large size and of better keeping qualities than those grown in California. The latter State, however, grows a greater supply of apples than most persons suppose. Nevada, Idaho, Utah, and New Mexico also grow apples to some extent. Colorado has many orchards beginning to bear.

#### DISEASES.

A great many inquiries come to me for remedies for Bitter Rot and Scab, but as these are matters which pertain to the special work of the Mycologist of this Department I have referred them to him for answer. It might, however, be proper to say, that so far, no remedies have been found for either of the above maladies.

#### INSECT DEPREDACTIONS.

I have had frequent questions and reports sent to me on this subject, but they properly belong to the Entomological Division, and have been there referred. It is with extreme satisfaction that I am informed of the increasing success of spraying the trees with arsenical poisons to combat the Codling Moth.

#### VARIETIES.

I desire to mention a few new varieties which have come under my notice, and some old ones of special value but little known. It is really unaccountable how varieties of fruits of most excellent character are overlooked or neglected by the general public. Notably among these is the apple known as

*Summer Rose.*

In my opinion this little favorite surpasses Carolina June, Early Harvest, and all the other early apples I know. It is as early as any, begins to bear soon after planting, and seldom fails to bear a good crop, even when most varieties fail.

The tree has a beautiful round head, the branches are stout but not heavy, with very distinct gray dots upon the new growth. It is essentially a family apple, beginning to ripen with the very earliest and continuing for about six weeks. It sells well in market, but is more especially a dessert variety. Originated in New Jersey.

Size, small, 2 to 3 inches; shape, flat to round, regular; surface, very smooth; color, white, with stripes and splashes of the most delicate tints of carmine; dots, very small; basin, wide, abrupt, and rather deep, regular; eye, small and colored; cavity, narrow, regular, not russeted; stem, usually quite short; core, large, closed, regular, meeting the eye; seeds, numerous, short, and plump, light brown; flesh, white, with rarely a tint of pink next the skin, fine grained, tender, crisp, juicy except when overripe; flavor, subacid, very pleasant; quality, as good as the best of the early kinds; season, from June to August, in the central States.

The illustration on Plate 4 is from a specimen grown on my own farm at Geneva, Kans.

*Ozark.*

This variety originated with Mr. Thomas Morchal, jr., of Crowell, Benton County, Ark. In the spring of 1884 he dug up a sprout from the stump where a Ben Davis tree had been broken down, and planted it. In the fall of 1887 this tree bore over a bushel of apples, and the specimen from which the drawing and description were made was sent me by G. F. Kennan, of Brightwater, in that county, but was grown on the original tree.

Size, large, 3 to 4 inches; shape round, regular, but sometimes unequal; surface, very smooth, light yellow, covered with suffused bright carmine; dots, small, light, on raised basis; basin, deep, wide, abrupt, regular; eye, small, closed or nearly so; cavity, wide and deep, russeted but little; stem, short, slender; core, regular, closed; seeds, large, long, dark; flesh, white, tender; flavor, subacid; quality, good; season, November to December, in northwestern Arkansas.

*Bella.*

This is a new variety brought to my notice by Charles P. Augur, of Woodbridge, Conn. The original tree stands near that place on a slaty hillside in a pasture belonging to Timothy Fowles. It is what might be called an open grower, and carries its fruit mainly on the outside branches. It bears annually and abundantly. Mr. Augur has sent cions to various States, and hopes to get favorable reports from them in due time.

Size, medium to large, 2½ by 3 inches; shape, round or nearly so, slightly conical, irregular but not ribbed or angular, unequal; surface, smooth, greenish-yellow thinly and partially covered with dull mixed red and darker splashes and blotches; dots, scattering, medium size, gray, prominent; basin, quite shallow, slightly folded; eye, open, shallow; sepals, short; cavity, shallow, narrow, heavily and

widely russeted; stem, short; core, small, nearly closed, clasping the eye; seeds, numerous, plump, light brown; flesh, yellow, a little coarse, but tender; flavor, mild subacid, pleasant; quality, good; season, in Connecticut, November to January.

### *Star.*

Although this is an old variety of uncertain origin, but probably Orange County, N. Y., it is thought highly of by many growers. It is not a very showy apple, but well worth a place in a family orchard. The drawing was made from specimens grown by L. B. Pierce, of Talmage, Ohio.

Size, medium, 3 to 3½ inches; shape, flat, slightly conical, unequal, regular; surface, smooth, greenish-yellow, with occasional slight show of red; dots, numerous, dark, prominent; basin, shallow, regular; eye, small, closed; cavity, rather shallow, sloping, regular, russeted; stem, short, slender; core, wide, almost closed, clasping; seeds, small, plump; flesh, whitish, tender, juicy; flavor, mild subacid, rich, pleasant; quality, very good; season, September to December, in Ohio; use, kitchen and dessert.

### *Huntsman.*

Although this apple has been described many years ago by Charles Downing and others, it is of so much worth and comparatively little known to the general public that I venture the repetition. Having originated in Missouri it has become best known in the West. It has, however, been grown in many parts of the country, and is generally highly praised. The tree is quite satisfactory in every way, and there is no yellow winter apple which sells better when sent to market. My specimens are from Abner Allen, of Wabaunsee, Kans.

Size, large, 3 inches, and often reaching 4; shape, flat, nearly always unequal, waved near basin; surface, smooth; color, a rich yellow, with very rarely a faint blush; dots, large, distinct, dark; basin, wide, rather deep, waved; eye, generally open, deep; cavity, wide, sloping, not russeted; stem, medium to short; core, large, wide, open, clasping the eye; seeds, large, plump, dark; flesh, yellow, fine grained, firm, juicy; flavor, subacid, rich, aromatic; quality, excellent; season, December to spring, in Kansas and Missouri; use, dessert and market.

### *Harbour*

This variety came to me from Mr. B. F. White, of Mebane, Alamance County, N. C. It originated in that county many years ago, and is thought to be a seedling of Abrahm, which it resembles in both tree and fruit in many respects. It is, however, a much better apple in nearly every way.

Mr. Harrison Harbour, of that locality, rescued it from extinction by getting a few buds from the old tree, which was about dead, and setting them in his own orchard. In a few years they bore fruit, and he called the attention of a nurseryman to the variety, who named it in Mr. Harbour's honor. The tree is rather slow in growth, but very hardy and long-lived. The fruit is evenly distributed over the tree, and hangs on with tenacity until cold weather. A little freeze does not hurt it. It is pre-eminently a winter apple. Its bright

color and rich aroma enhance its value greatly. The illustration (Plate 9, Fig. 1) was made from a specimen sent by the gentleman above named.

Size, small, 2 to 2½ inches ; shape, flat or apparently round, regular ; surface, smooth, the yellow under color nearly covered with bright carmine, diffused striped and splashed, a light bloom where not handled ; dots, small, indistinct, yellowish gray ; basin, abrupt, deep, almost regular ; eye, small, open, shallow, segments of calyx reflexed ; cavity, medium to shallow, regular ; stem, short, slender, straight ; core, small, broad, open ; seeds, large, broad, dark ; flesh, yellow, crisp, firm, juicy ; flavor, subacid, rich, very pleasant ; quality, very good ; season, January to late spring in North Carolina.

### *Orange Winter.*

This variety originated with Mr. Orange Winter, of Sauk County, Wis., from seed of Perry Russet which it resembles in tree, except that it is more hardy and productive. The buds and leaves are very thickly set along the twigs. It was introduced by J. W. Shoards, of Reedsborough, Wis., and given the above name in honor of the originator. I have endeavored to have the name changed to something less common and that would not be misleading as to its season, but this seems to be quite impossible from the fact that it is already widely distributed under that name. My specimens were from Mr. A. L. Hatch, of Ithaca, Wis.

Size, large, 3 to 4 inches diameter ; shape, flat, a little inclined to one side ; surface, a little rough, dull yellow, not blushed ; dots, numerous, very small, prominent ; basin, wide, deep, waved but not folded ; eye, deep, closed ; cavity, wide, sloping, not russeted ; stem, medium in length and thickness ; core, very broad, but closed ; seeds, pointed, plump, dark ; flesh, yellow, rather coarse ; flavor, subacid ; quality, good, but not extra ; season, October and November in Wisconsin.

### THE GRAPE.

The grape crop of 1887 was very good, except in a few localities where the Black Rot affected it ; but as this disease is induced in a great measure by frequent rains and a humid atmosphere, and as the reverse of this was true in the greater portion of the grape-growing area of the United States, little damage was sustained. Grapes were plenty and cheap in the markets. In California the grape succeeds admirably. The varieties grown there are entirely different from those of the Eastern States and belong to the species *Vitis vinifera*. There are thousands of acres in a single vineyard. The Napa valley is almost entirely devoted to the growth of the vine. I have been credibly informed that as much as 17 tons of grapes have been grown on an acre in several cases, and that 10 tons per acre is by no means rare. From what I saw there I have no doubt of the truth of these statements.

Grapes are there chiefly made into wine, but the manufacture of raisins is becoming a leading industry. This is especially true of that portion of the San Joaquin valley in the vicinity of Fresno and Tulare. I know that for the production of raisins this region is peculiarly adapted. The soil is excellent, the water supply for irrigation abundant and cheap, and the long rainless season during ripening peculiarly suitable.



The Sacramento, Sonoma, Santa Clara, and Santa Ana valleys also produce good raisins, and in the vicinity of San Diego they are made equal to any that I have ever tasted from Europe. The raisins of the El Cajon are famous, and will be more so as time goes on. In fact, the importation of foreign raisins is already checked, and we are likely to be able within the next ten years to produce within our own borders all the raisins our people will need.

Arizona is also coming to the front in this matter. The Salt River, Gila, and other valleys can grow good grapes of this class, and the long, hot, and dry summers and falls are well suited to curing them into the best of raisins.

New Mexico and the extreme western portions of Texas, notably about El Paso, can also grow the foreign grapes. The cold of the winters, however, makes it necessary to cover all the vines with earth during the time of danger. When so prepared the vineyards resemble fields of huge sweet-potato hills.

Florida has not been generally thought suited to the growth of the grape until within the last few years. Experiments are now being made with many varieties, both foreign and native.

Many new varieties are being each year brought to notice all over the country, and a very few are noticed in this report.

#### *Eaton.*

Among those for which much is claimed is the Eaton. It originated with Mr. Calvin Eaton, of Concord, N. H., about 1868. The vine is a very strong grower, with large leaves of the Concord type. It is said to be as hardy as that variety. The cluster is of moderate size, but the berries are extra large for a native American grape. The color is black, and the season medium. Skin rather thick. In flavor I do not think it quite equal to the Concord, although others think it fully equal. It deserves trial.

#### *Lutie.*

This grape originated in Tennessee and is there thought of superior quality, especially as an early variety. Not having been able to get samples of it, I defer a more extended notice of it until I can obtain them and speak from more intimate acquaintance.

#### *Jewell*

Was referred to in my report of last year, and another year's experience with it in the hands of the few who have fruiting vines seems to indicate that it is a valuable variety. I would at least recommend that it be given a fair trial.

Ten new seedling grapes were sent to this division in proper season from Mr. Theophile Huber, of Illinois City, Ill. They were nearly all of good quality and deserve to be better known. The two following are of that number:

#### *Emma.*

This is, to my mind, the best in quality of the whole lot. The cluster is of medium size, well shouldered, and rather open. The berry is medium size and round. The skin is very thin and tender

and of a beautiful translucent yellow color. In flavor it is rich and delicate and without foxiness. The pulp is very tender.

*Marie Louise.*

This is another of Mr. Huber's seedlings. The cluster is about like that of Concord. The berry is round, rather thick skinned, and in color a rich greenish yellow. The flavor is very pleasant.

#### THE PEACH.

Taking the country over, the crop of 1887 was a failure. In a very few sections it was medium, but nowhere heavy. Severe cold in winter, spring frosts, "yellows," and the ravages of the "rose-bug" (*Macrodactylus subspinosus*), although acting in different localities, have combined to produce this unfortunate result. California alone had a good crop. What few peach trees there were in Arizona large enough to bear, produced abundantly. Specimens were received from there on November 20 in such sound condition that they were kept for fully a month later. These specimens came under the name "December Cling" and were of a whitish color and rather poor quality, but it showed what has been done in that region, and suggests what else might be done. In Florida, southern Texas, and other sections lying next the Gulf of Mexico, a different class of peaches must be grown from those that succeed in the North. But as this subject is specially treated in a report by Mr. G. Onderdonk, of Nursery, Tex., which appears as part of the present report of this division, I will only say that there is no doubt of the truth of the above statement. The Asiatic varieties seem to do best, and I hope next year to give a detailed account of some of the newer varieties belonging to this strain. Mr. J. A. Bidwell, of Orlando, and Mr. James P. De Pass, of Archer, Fla., have brought out several new varieties of this character which are worthy of extended trial in that State. Mr. Onderdonk, of Texas, has long been engaged in similar experiments.

#### THE PLUM.

There is an increasing interest in plum culture in many parts of the country. Of course California and Oregon are far ahead of all other States, because of the absence of curculio. All species of plums do well there, but the European varieties are almost entirely planted. The bulk of the crop is dried, and is already having a marked effect upon our importations. The quality is fully equal to the best foreign brands. I have never seen elsewhere such large and fair-looking dried prunes as those sent to this office from Oregon. They were made from Coe's Golden Drop plum. Arizona, New Mexico, and the Rio Grande valley, near El Paso, Tex., also grow good plums of similar varieties because of their exemption from curculio.

In all that part of the United States lying east of the continental divide this insect pest still holds sway, with the exception of a very few localities. The most favored of these is a strip including but a few counties lying next to Lake Michigan between Grand Haven and the Straits of Mackinac. Thousands of bushels of the best of plums were shipped from there to Chicago, Milwaukee, and other

markets during the past year. In western New York and some parts of New England a few were grown. With native American species much better success is generally attained, because the larva of the curculio for some reason does not thrive so well as in the European species. Wild Goose, Miner, De Soto, Newman, Marianna, and Robinson are among the best of this class. Where several varieties are grown near each other they seem to bear better than where only one variety is planted, and it is thought this is the result of cross-pollination. However this may be, I would advise mixed planting, judging by the reports of many growers and by my own experience. In any case no harm can result, and the grower will have a succession of fruit.

Japanese plums are being more generally planted, and especially in the South. That there may be varieties from Japan which will prove to be hardy in the North is possible, but as yet I am by no means certain that any such which bear good fruit have been introduced.

The following varieties are mentioned, for reasons stated in the descriptions of each :

*Kelsey.*

This plum was described in my annual report of last year. Another year's experience has proven it to be gradually becoming more and more popular in the Southern States and California. It continues to bear well, but is not exempt from the attacks of curculio in regions where that insect abounds. Specimens from Prof. J. N. Whitner, of Lake City, Fla., were badly stung.

The colored plate of this variety which appears on another page (Fig. 1, Plate 1) was made from specimens sent by Prof. E. Hilgard, of Berkeley, Cal. The size, shape, and color of the fruit, as well as the leaves and bark, resemble the specimens as near as they could be made, and are in no sense overdrawn.

The flesh is quite firm, of a delicate yellow color, and clings to the stone. The flavor is equal to that of the ordinary varieties cultivated in the United States. In each specimen examined by me there has been a peculiar cavity of an irregular shape near the seed, similar to that shown in the illustration. It seems to be a characteristic of the variety.

The tree is of upright habit and thrifty in growth. The leaves are rather narrow and lanceolate, like those of Wild Goose and other native American plums.

Owing to the early blooming of the Kelsey the fruit crop is often cut off by frost, especially in the Gulf States. I desire to reiterate the statement of last year that the tree is about as tender as the fig, and will not endure the winters north of Texas, Tennessee, and South Carolina. Even there the trees are sometimes tender.

Owing to its very late ripening the fruit would not mature in the Northern States, even if the trees would grow there. There has been some difference of opinion as to its hardiness, and some have claimed that trees of Kelsey have withstood the winters of New York and New Jersey. In view of the fact that Kelsey trees have been positively known to have been killed by the winters of northern Texas, it is quite probable that those in New York and New Jersey so reported are spurious. If this should prove to be true, it is evidence that mistakes have been made in sending some other variety of Japanese plum to the above States under that name.

*Satsuma.*

This is a variety of plum which is native in Japan, and of very recent introduction here. The only tree in bearing in America, so far as I have been able to learn, is one on the premises of Luther Burbank, of Santa Rosa, Cal. The specimens from which the accompanying colored plate was made (Fig. 2 on Plate 1) grew there.

The tree looks much like Wild Goose plum, and may prove to be more hardy than Kelsey. This, however, is not yet known, but trees will next year be tested in many places both North and South. It bears very abundantly. The fruit is of a pleasant flavor and, unlike all plums, either native or foreign, before tested in America, it is red-fleshed.

The stone is remarkably small. The illustration is as true to nature in all respects as art could make it.

*Blackman.*

In addition to the statements made last year regarding this variety I have to say that it has continued to prove itself of no value, because of the trees being universally and entirely unfruitful. There being some question as to the real character of this variety, early in the spring of this year I wrote to several of the most reliable nurserymen and fruit-growers of the country for cions from bearing trees on their grounds, and requesting them to keep a close watch on the behavior of the variety. Mr. W. C. Barry, of Rochester, N. Y.; Hoopes Bros. & Thomas, of West Chester, Pa., and Mr. E. B. Engle, of Marietta, Pa., each sent me specimens. They were all in good condition and well supplied with fruit buds, and of the same variety which I have without exception seen in the nurseries and orchards of Texas and other States under this name.

Later in the season these parties wrote me that to their astonishment none of the fruit buds on their trees developed into blooms, but dropped off as if they had been killed by frost, when there was no frost to kill them. In other words, they seem to have been abortive from some natural defect.

I also addressed Mr. W. M. Clark, of Nashville, Tenn., who I had learned was acquainted with the early history of this so-called plum, asking him to report to this division what he knew of the matter, and to visit the original tree and send me cions from it. In response to this request he sent me the following, under date of March 24, 1887:

My mother (Mrs. Charity Clark) visited, just after the war, Dr. James E. Manson, a nurseryman of Rutherford County, this State, and brought away some plum seeds from an orchard composed of Wild Goose and Washington plums, and gave them to Dr. Blackman, who planted them. This tree came up with others, and when it bore fruit it was seen that it was different and superior to them. I send a few twigs from two trees, both differing, one never having borne fruit (I mark it "mule"), the other the Blackman plum. And thereby hangs a tale: Mr. J. J. Newson, a nurseryman here, procured buds from the former tree and widely distributed the trees propagated from them. The Rose Bank Nurseries, owned by Truett's Sons, of Morgan, Tenn., sent an agent to Blackman's and got a large lot of slips or cions from the "mule," mistaking the tree, because it resembled the ordinary plum less than the genuine tree. Thus we have *two* Blackman plums, one genuine, the other spurious. Of course, those purchasing of the Rose Bank Nursery believe it to be a humbug, while those buying from Newson must be delighted with it.

Again, under date of April 13, 1887, he says :

According to your second request, I repaired at once to Dr. Blackman's, but found the flowers very scattering on the tree from the effects of age and frost. On the "mule" flowering had been intercepted entirely by frost, but I secured the embryo of this, and all the flowers I could of the other, and now have them under pressure and will send them as soon as dry.

It will be seen from these letters that there were two seedling trees on the premises of Dr. Blackman from which buds have been taken by two rival nursery firms and sent out to the world, one of which was probably good and the other worthless. By some ill-fortune the valuable variety has not been generally distributed, but the bad one has been sent far and wide. The samples from this original "mule" tree sent to me by Mr. Clark correspond exactly with all those received from nurserymen and seen by me in many States. It is rather a significant coincidence that the fruit-buds on this original tree failed to open into flowers, just as in the cases of those on the premises of Hoopes Brothers & Thomas, and others.

The other seedling tree in Dr. Blackman's yard (having since died) produced flowers, and the samples of branches and flowers of it sent here by Mr. Clark appeared almost identical with Wild Goose plum, but very unlike the variety under consideration. It has recently been named "Charity Clark" by Dr. Blackman and Mr. W. M. Clark, of Nashville, Tenn., who have the prior right to give the name the fruit shall bear, and in honor of Mrs. Clark, who got the seed of Dr. Manson.

That such a mistake should have been made (and no doubt it was a mistake on the part of Truett's Sons, of Morgan, Tenn., in getting buds from the wrong tree, and not an intended deception) is a serious matter to many nurserymen who have propagated the variety largely, and to many growers who have planted trees of it. Although thousands of dollars have been lost on this worthless freak of nature under the name of Blackman plum, the discovery by me of its true character when in Texas, in 1886, and having informed the public of the same at once through the public press, checked its distribution and saved the country from further waste of time and money.

Any persons yet having trees of this spurious variety should either dig them out or graft them. That there may be no uncertainty as to their identification, I will say that the tree in both leaf, bark, and arrangement of buds almost exactly resembles those of a peach tree. It is moreover a very thrifty grower. It is thought by several expert botanists to be an accidental cross between the peach and plum, but of course this is only the presumption entertained from the fact of the original tree having grown from the seed of a Wild Goose plum and from examination of its general characteristics. As a tree it is a success, but as a fruit a complete failure.

#### THE ORANGE.

(*Citrus auranteum*.)

The culture of this fruit in the United States is rapidly increasing. What is known as "the big freeze of 1886" in Florida, and which was indeed unparalleled in the history of that State, did not materially injure the orange trees there. In Louisiana a considerable area lying near the mouth of the Mississippi River is devoted to this fruit, and excellent oranges are grown there. In the immediate vi-

cinity of New Orleans the orange orchards were badly hurt by the freeze of 1886, and many of them have not yet recovered. In California, as far north as Redding, which is within sight of Mount Shasta, I saw orange trees in bearing. What is known as the "thermal belt" extends along the foot-hills of the mountain ranges, and it is in this belt that the orange grows in the central and more northern parts of the State. In the extreme southern counties the culture is carried more into the valleys, and especially at Riverside is this true.

Ripening at different times, as do the oranges of these States, our markets are or can be supplied with this delicious and healthful fruit for more than half the year.

In addition to this, new varieties are being originated and brought to notice, some of which are fully two months earlier than the earliest kinds before known, and some are fully that much later than the latest varieties in general cultivation. The main orange crop of Louisiana ripens from November 1 to February 1, that of Florida from December 1 to March 1, and that of California from February 1 to May 1. This covers six consecutive months, and a little more is gained both before and after this period by artificially handling the fruit.

It should always be borne in mind in considering the qualities of the oranges of the different sections of the country that climate has a marked effect upon this as well as all other fruits. The skin of nearly all varieties is thicker and more free from defects in California than in Florida and Louisiana and the flavor much more tart. The misunderstanding of this fact often leads to much confusion regarding the identity of varieties and their adaptability to certain localities.

Those that are very mild-flavored should not be grown in Florida, because they become insipidly sweet, and those of very tart flavor become really sour in California. If such kinds are planted reversely to the above they will in both cases be much improved.

In one, and only, one rare case I tasted a seedling orange grown in California that was so very mild-flavored as to be almost tasteless. In Florida and Louisiana the flavor of all oranges is usually very mild and pleasant.

The following varieties are worthy of special mention:

*Satsuma.*

From the best authority I have at command, this variety came from Japan to the United States about 1876. It has been grown in Florida since that time and is there known as the hardiest of all oranges. It is named after the province of Satsuma, in Japan, where it is largely grown.

At a later date it was brought to California. Recently thousands of trees of this variety have been imported from Japan by several firms in California under the name Unshiu (or as some have it, Oonshiu, to better indicate the pronunciation), which may be a common name for it in Japan. But as Satsuma has been applied to it in the United States for many years previous to these later importations it seems best to give the last name the preference. Having examined and eaten the fruit sent directly to this office from Japan, that imported and sold in California, and having also gathered specimens with my own hands from the trees in that State under the name Unshiu, and also having received it from many places in Florida

under the name Satsuma, I am fully convinced that all these samples were of the same variety.

The tree is described by my Japanese correspondents as spreading and dwarfish or even bushy in habit, very productive, and with broad leaves like ordinary oranges. This accords with what I have seen in California and what is reported to me from Florida. It is of the class to which the title "mandarin" is applied, because of its small size, flat shape, and very loose skin, which are characteristics of that class.

The illustration on Plate 5 of this report was made from specimens from Lyman Phelps, of Sanford, Fla.

Size, small to medium, 2 to 3 inches; shape, flat, a little pointed next the stem; color, bright orange; skin, rough, wrinkled next the stem, very loose and easily separated from the flesh; core, almost none, but instead a cavity often three-eighths inch in diameter in center; seeds, almost wanting; flesh, orange color, darker than the skin, not so juicy as some; flavor, very sweet, rich, very aromatic, peculiar; quality, very good; season, early.

#### *Foster.*

This variety originated with Mr. C. H. Foster, of Manatee County, Fla., as a chance seedling grown from seed brought from Havana, Cuba. As a very early orange it is especially desirable. The original tree, now about forty years old, is said to be productive, and a well-beaten path to it attests the esteem in which the fruit is held. The following description of the fruit was made from specimens sent me by Mr. P. W. Reasoner, of Manatee :

Size, medium, 3 inches; shape, round or nearly so; color, pale orange; skin, smooth, thin; core, medium to large; seeds, numerous, elongated; flesh, light-colored, juicy; flavor, mild, pleasant, but not very rich; quality, good, but not best; season, very early, specimens received from Manatee, Fla., fully ripe on September 10, 1887.

#### *King.*

This orange was introduced from Cochin China, in 1882, by Dr. R. Magee, of Riverside, Cal. It has been grown in California and Florida by a very few persons, and the fruit is esteemed by those who know it best. I have frequently tested it, and have also recently seen the tree in bearing on the grounds of J. E. Cutter, at Riverside, Cal. The tree, although of upright growth, is rather ragged in appearance. The leaves are dark, and the branches thorny. On the whole, I do not like the tree. The fruit partially resembles the mandarin orange and may be described as follows:

Size, small to medium, 2 to 3 inches in diameter; shape, flat, wrinkled and drawn to a point at the stem; color, dark orange; skin, rough, rather thin, parting easily from the flesh; core, rather small, open; seeds, numerous, round; flesh, dark, sections part easily, juicy; flavor, very sprightly, tart; quality, good; season, late; received from Riverside, Cal., in good condition June 20, 1887.

#### *Konah.*

The history of this orange I have from Mr. A. P. Combs, of Riverside, Cal., who states as follows:

About the year 1866 J. DeBarth Shorb, of San Gabriel, Los Angeles County, had a very fine orange sent to him from the island of Konah, in the Pacific Ocean. He

planted the seeds, and raised from them two trees. One of them died, but the other did exceedingly well, and he propagated from it quite largely. It proved to be a very good orange and considerably above an ordinary seedling. It ripens about one month earlier than an ordinary seedling, is of a fine, rich, lively color, of good size, medium number of seeds, and, take it all in all, it is a first-class orange, but not equal to the Washington Navel, Mediterranean Sweet, Maltese Blood, or Paper-rind St. Michael.

From personal observation in the orchard of J. E. Cutter, of Riverside, I know the tree to be a handsome, upright grower, productive and thornless. The leaves are very pale green; the fruit is of medium size, about three inches; in shape almost round, but inclining a very little to oblong; skin, rather smooth, of pale color and thin; Core, medium, sometimes a little hollow; seeds, numerous, well developed, but usually pointed at both ends; flesh, pale colored, very juicy; flavor, mild, pleasant, but not rich; quality, very fair.

*Hart's Late.*

(Synonym, Hart's Tardiff.)

The origin of this orange is uncertain. The first positive knowledge of it is that S. B. Parsons, of Flushing, Long Island, about 1875, took it from his greenhouses on Long Island to his nursery near Palatka, Fla. He thinks it came to him from Thomas Rivers, of England. Edmund H. Hart, of Federal Point, Fla., got it from Mr. Parsons's nursery, and it was in his hands that the real value of the variety first came into public notice. On the 25th of April, 1877, the fruit was first brought before the meeting of the Florida Fruit Growers' Association by Mr. E. H. Hart, and "it was found unripe and unpleasantly acid." On June 13 of the present year (1887) Mr. Hart sent specimens to this office which were in prime eating condition.

Size, medium, about 3 inches; shape, oblong, a little tapering towards the stem, which is set in a slight depression; skin, rather thin, a little roughened, deep pits on surface; color, bright orange; core, medium, quite firm; seeds, numerous, rather slender, pointed; flesh, light colored, very juicy; flavor, a pleasing combination of sweet and acid; quality, very good; season, very late, from May to July in Florida.

*Washington Navel.*

(Synonyms, Bahia, Riverside Navel.)

This orange was illustrated in my report of last year, and a brief history of it there given. The name Bahia which was then used is that which has the prior claim, but as I stated in that report, Washington Navel has become so much more commonly used instead that the old name which Mr. Saunders, of this Department, gave it is forced to give way. There has been so much interest shown within the last year regarding the origin and bearing qualities of this variety by the fruit-growers of the orange regions, and it is of so much practical importance that I have taken special pains to investigate the entire subject.

As a result I have to say, that the twelve orange trees which Mr. Saunders, as superintendent of the gardens and grounds of this Department, imported from Bahia, in Brazil, were all of the same variety. After examining the original trees yet in the orange-house



here and testing their fruit, and that of their progeny grown in many places in Florida and California, and after reading with care nearly all that has been published in the papers on the subject, I am convinced of the truth of the above statement. It is claimed by some that the two trees (some ignorantly say one,) sent Mrs. L. C. Tibbetts, of Riverside, Cal., were a part of the original imported twelve and that they were a different variety from the rest. This is a mistake. These trees were propagated from the original twelve and were sent to Mrs. Tibbetts in 1873, which was three years after the importation occurred. Since submitting my former report I have visited the two trees and gathered and ate fruit off them. They each bear fruit alike in character, and identical with that sent me from many places in Florida and California under the two names above mentioned, and similar to that produced on the old trees here at Washington.

The name Riverside Navel was applied to it in California, because the first fruit produced in that State was at Riverside and on these two trees.

In regard to productiveness I have conflicting reports. In Florida it is in many cases reported as being fruitful enough, but more frequently the reverse. At Riverside I examined many bearing orchards of this variety, and almost always found the trees well loaded. Commercial growers there told me that their Washington Navel trees bore quite well enough. In the number of oranges on a tree it is not equal to most other kinds, but the extra size and quality of the fruit and extra price obtained is thought to fully make up for the lack in number.

Although the trees bloom very abundantly, and in most cases the fruit sets well, it drops badly soon after setting. Why this occurs is a query. After tedious examination of the anthers of the flowers of this and many other and more fruitful varieties under the microscope, taken from the trees here, and those sent from Florida and California, with a view to discover the absence or presence of pollen, I am convinced that the Washington Navel has almost no pollen. The naked eye shows a marked difference; for instead of being yellow with pollen grains, as the anthers of most varieties are, they are white; and by the aid of a powerful microscope only now and then a grain of partially-developed pollen was found. Whether or not this is the cause of its shy bearing is not certain, for there are supposed to be plenty of grains from other varieties floating in the air sufficient to pollenize the stigmas of its flowers.

This variety being almost entirely seedless, it may be thought to be the result of the lack of pollen. The peculiar umbilical mark at the blossom end of the orange, which gives the name "Navel," is rather singular. There are, however, other "Navel" oranges which always have this mark, and the same peculiar feature is occasionally noticed in many varieties. This is an abnormal characteristic, or monstrosity, which seems to me a sort of secondary orange just at the apex of the fruit, or an additional placenta running the length of the whole fruit, but larger at the end opposite the stem. It will take much additional experiment and study before any safe conclusions can be reached on this whole subject. The co-operation of all interested persons is earnestly desired.

## THE POMELO (synonym, Grape Fruit).

*(Citrus pomelanus.)*

Although closely related to the shaddock, this is a fruit of excellent quality. It ripens mainly after the orange is gone and is then highly esteemed. Florida produces the best in quality and almost the entire amount grown. In the northern markets it is becoming popular and will be a very profitable crop to grow. The flavor is quite peculiar. It is somewhat bitter, but withal very agreeable, especially after a second or third trial. There is to my mind no more wholesome and refreshing fruit for dessert use during the spring and summer. It should be eaten by cutting the fruit in halves crosswise and using a spoon to avoid the bitter taste of the rind.

Most varieties are of large size, often 5 inches or more in diameter, and nearly round, being slightly flattened at the stem and blossom ends. The color is uniformly a light yellow. The name "grape fruit" was given to it from the fact that the fruits hang so closely along the branches as to crowd each other and in the distance look like huge clusters of yellow grapes; but the name is otherwise so inappropriate that I have decided to use *pomelo* instead, which name is, however, less used than the former.

## THE KAKI\* (or Japan Persimmon).

*(Diospyros kaki.)*

So far as I have learned the first trees of *Diospyros kaki* grown in North America were from seeds obtained and sent by Commodore Perry, of the U. S. Navy, to Lieutenant Maury, in 1856, and were planted at the Naval Observatory at Washington. The first fruit was produced on these trees in 1860. None of these seedlings, so far as known, were distributed or any of their progeny, and the old trees are now dead.

The next introduction of this species was by a lot of seeds imported from Japan by Mr. William Saunders, of the United States Department of Agriculture, in 1863. They were planted on the grounds of the Department and germinated freely, and a part of the seedlings were sent out for trial. Some of the original trees grew to bearing size, and in at least one case produced about a bushel of fruit on a single tree, but all of these older trees on the grounds of the Department are now dead. Owing to the crude state of pomology in Japan it was almost impossible to get grafted trees until about the year 1870, when the Department of Agriculture imported a lot of grafted trees of named varieties. These were distributed all over the United States, but principally in California and the Gulf States. The nomenclature of these varieties was very imperfect, many trees being without name, some with dual names, and different varieties with the same name, as subsequent experience has proven.

At the present time (1887) great difficulty is experienced in identifying the varieties of this fruit; but in response to my requests a large number of specimens were this year sent here for study and comparison. These were from Georgia, Florida, Alabama, Louisiana,

---

\*Pronounced Kahkee.

Texas, and California. The names attached to the same variety were only in a few cases the same. Generally no names were given, or those evidently wrong, and scarcely a person sending them laid claim to their correctness. Great pains were taken in studying and comparing these specimens with each other and with the best original drawings and paintings of the named varieties of kaki made in Japan by native artists. This work is to be vigorously prosecuted the coming year (1888), and I trust that all persons who have bearing trees will send specimens here, and thus assist in carrying it forward.

As the result of these investigations three varieties—Hachiya, Tane-Nashi, and Yemon—have been quite clearly identified and are illustrated on Plates 2 and 3 of this report. Their size and shape are exactly given, and their color as nearly as could be copied.

A great many of the trees sent out by this Department (which included many of the first seedlings grown by Mr. Saunders) died from being planted in too cold a climate, and some that were planted where they ought to have done well were very much neglected and, having done poorly, created little interest. But some of them, under more favorable circumstances of both climate and culture, produced excellent results, and the nurserymen of the country began to import and sell trees. New seedling varieties are now being originated in the Southern States, and some are of excellent quality. It is hoped to cross this species with our native persimmon and thus get kinds that will be hardy and bear large fruit.

After repeated trials all over the United States it is now known that the species will not thrive in a climate where the temperature falls to zero even occasionally, and some varieties are still more tender, as there is considerable difference in the varieties as to hardiness. The northern limit of successful growth is about like that of the fig, being on a line with Charleston, S. C., southern Tennessee, and northern Texas, but extending several degrees farther north along the Atlantic and Pacific coasts. Georgia, Florida, the Gulf States, and California seem well adapted to its culture, and by experienced travelers in Japan is said to do better here than there, the fruit here being larger, fairer looking, and of better quality. In California the fruit does not seem to be as large or as luscious as that grown this side the Rocky Mountains, and is not thought so highly of in that State. This is, perhaps, owing to the dry climate. The tree is a more luxuriant grower than our native species, *D. virginiana*, and makes a handsome ornamental tree, with large, glossy leaves.

After another year's observation I have determined that the flowers are sometimes perfect and sometimes the stamens are abortive. The perfect flowers are always found in the axils of the leaves and always solitary. The imperfect flowers are sometimes found in clusters. The species may be said to be dioeciously polygamous.

The fruit, in size, is from  $1\frac{1}{2}$  to  $3\frac{1}{2}$  inches in diameter, and an occasional specimen has been known to weigh 20 ounces. In shape it varies from flat to round and oblong-conic. In color it is from chrome-yellow to bright orange-red, the latter being the most common. In flavor it is very sweet and the pulp is usually very soft. There is, however, considerable variation in both these respects. Some of the varieties require frost to make them at all palatable or before their natural acidity will leave them. Others are never acid in any stage of their growth. Many kinds are entirely seedless.

As a fruit it is steadily winning its way into the markets of our larger cities and may occasionally be found on the fruit stands of

our large cities in the North. Up to this date there has been but little of the fruit to sell. The largest amount grown by any one person or firm of which I have heard was by Mr. J. Crawshaw & Son, of Lawtey, Fla. I have been informed that the past year they sold about 100 bushels, principally in New York City, at an average price of about \$7 per bushel. The fruit ships remarkably well, as it should be picked a little before it is ripe, and can then be transported with perfect safety for thousands of miles. It matures and softens very gradually, and makes an excellent fruit to handle by retail dealers. It has an additional advantage in being very attractive in appearance.

*Hachiya.\**

This variety grows to the largest size of any I have yet seen. The shape is oblong-conic, dropping off rather abruptly to a point. Many specimens are decidedly quadrangular. The color is a dull yellowish scarlet, with small dots, and occasional blotches of a brownish cast, generally found more numerous near the apex.

The flesh is rather firm and of a dull color, with reddish streaks running through it lengthwise of the fruit. Seeds rather numerous and very long and slender. The flavor is sweet when fully matured, but quite astringent when only partially ripe. The quality is below that of some varieties. It is one of the principal varieties used for drying in Japan. The illustration (see Plate 2) was made from a specimen from Lyman Phelps, of Sanford, Fla.

*Tane-Nashi.†*

Size, large to very large, some specimens having a diameter of 3 inches. The shape is roundish conical, or heart-shaped, and very symmetrical, there being no approach to quadrangular, as in some others; scarcely any cavity at the base, and stem one-half inch long. Color, bright orange-red, without any mixture of dull shades. The flesh is quite soft and in flavor a rich sweet; astringent before full maturity. It is without seeds. This is another of the varieties commonly dried in Japan. It bears well and is, all things considered, one of the choicest varieties. When fully ripe the fruit looks like a ball of translucent jelly, and the taste does not belie its good looks. Specimens illustrated on Plate 2 are from O. P. Rooks, of Gardena, Fla.

*Yemon.*

Size, medium, the diameter being from 2 to 3 inches; shape, flat, nearly always with four well-marked sides, and the same number of deep sutures running into a deep cavity, in which the stem and calyx are set. The point is a little depressed, and indistinct sutures run towards the four corners. The color is a bright scarlet. A delicate bloom covers the surface.

The flesh is of a dull chrome red, and when fully ripe so soft as to require a spoon to be used in eating it. The flavor is a most delicious sweet. It is quite generally thought to be one of the best in quality of any yet imported. This fact, together with its habit of

---

\* Pronounced Hah-chee-yah.

† Pronounced Tah-na Nah-shee.

great fruitfulness and entire absence of seeds, makes it one of the best to grow.

The illustrations on Plate 3 were made from specimens from W. W. Thompson, of Smithville, Ga.

### THE OLIVE.

(*Olea Europea.*)

One of the expensive articles of commerce that we of the United States have at present to buy abroad is olive oil. There are vast tracts in California, and possibly a few localities in other States where the olive will thrive. In fact it is now being planted extensively in California; in some cases as many as 40 acres or more in one orchard. Recently I had the pleasure of visiting some of these orchards. At the farm of Mr. Edward E. Goodrich, near San José, in that State, I saw the trees in bearing and the fruit being made into oil. Some of the trees had grown to nearly a foot in diameter and others were only just planted. This orchard and those of Mr. Elwood Cooper, of Santa Barbara, and Mr. Frank A. Kimball, of National City, the latter in the extreme southwestern county in the United States, are the largest yet planted. Mr. Luther Burbank, of Santa Rosa, is largely engaged in the propagation and sale of olive trees. It is my opinion that the best lands of the State for olive culture have not yet been planted. I refer to the foot-hills of the Sierra Nevada and other ranges lying back from the coast, and out of the way of the fogs and damp air nearer the ocean. The scale-insect, which is one of the pests of the olive, will not be likely to be troublesome there, and there is plenty of cheap land to be had, which in California is a desideratum. The rather elevated lands where frost will not be severe, and where the soil will not be so rich or moist as to induce a too rapid growth, will be the very best for this purpose.

Experiments are begun in olive culture in Florida, Texas, and other Southern States, but as yet no results worthy of report have been reached, except that the trees grow well.

Pickled olives are becoming more popular upon the tables of our people, and are very nutritious and wholesome. They are usually pickled while green, but to my taste those nearly ripe are much more palatable and also more nutritious. The fully ripe fruit in a raw and unpickled state is never eaten, possessing a very disagreeable bitter taste. The tree is very graceful and serves well the purposes of a street or shade tree.

The two varieties in general cultivation in California are described below:

#### *Mission.*

About one hundred and sixty years ago the Catholic fathers planted trees or seeds of the olive at the old mission of San Diego, now near the city of that name in California, which are yet standing and bearing, although entirely neglected. These trees are the origin of what is known in California as the "Mission" olive, and which is illustrated on Plate No. 6 in this report. The specimens from which this illustration was made were taken by me from the orchard of Mr. E. E. Goodrich, near San José, in Santa Clara County, and fairly represent the variety. It is thought to be one of the best known for pickling,

and produces an abundance of oil. Some growers do not consider it as prolific as some other varieties.

*Picholine.*

This variety was imported from France by the late B. B. Reading, with a number of others, and planted on his ranch near Sacramento, Cal., several years ago. All the others died, and after Mr. Reading's death it was propagated, supposing it to be a large-fruited variety. But the first fruit proved to be quite small. It ripens about six weeks earlier than the Mission and bears more abundantly and has smaller and narrower leaves. The tree has a compact, hardy, and vigorous growth and the cuttings root easily.

THE DATE.

*(Phœnix dactylifera.)*

No doubt many persons are ignorant of the fact that the date palm grows and bears fruit in several of the warmer parts of the United States. In Louisiana there were several bearing trees of this species, but the freeze of 1886 killed all but one of those in the city of New Orleans, and if any others are standing in that State I am not aware of it. In Florida there are many trees, but only a very few in bearing. The same is true of California.

I have no doubt but that the date will within a few years be successfully grown in limited sections of these States, and especially in California and Arizona, where a supply of water sufficient to keep the roots moist can be furnished. The conditions suitable to date culture are hot and dry air, and rich soil with abundant moisture in it. These conditions can be secured much better in a few valleys in the southern parts of Arizona and California than elsewhere in the United States. The air is quite torrid for months at a time, and the irrigation ditches will supply the water; but I do not expect that a sufficient quantity will be grown for many years to come to supply any considerable portion of the market demand.

Last October a cluster of ripe dates was received at this Department from Mr. O. F. Thornton, of Phoenix, Ariz., which was one of three borne by a tree seven years old from seed growing on the ranch of Col. F. C. Hatch, near that place. There were a number of seeds planted there by Mr. Culbertson in 1880, who afterwards sold the ranch on which they grew. This tree had also bloomed in 1885, but no fruit was matured as the bloom was cut off as a curiosity. Only one other tree besides this was preserved (the others having died in transplanting), and it fortunately is a male. The cluster contained 211 fruits of a chrome-yellow color, slightly tinged with bronze, and, all told, weighed 5 pounds. The seeds were perfect, and many of them were sent to Florida and have now grown into thrifty plants.

THE CRANBERRY.

*(Vaccinium macrocarpa.)*

Although the culture of the cranberry is from climatic reasons restricted to a small territory compared with its market range, it is by no means an insignificant fruit. It is wholesome and palatable to the consumer, and profitable to the grower where he has the right

kind of bog-land in the right climate, and has the necessary money, skill, and thought to devote to its culture.

Cape Cod, Mass., is perhaps the Mecca of the cranberry-grower. But there are good bogs in other of the New England States, and in New Jersey, Michigan, Wisconsin, Minnesota, and, I think, in portions of northern Oregon and Washington Territory also. The bogs of Alaska may prove to be of much value in this line, as the berry is reported to me as growing there in a wild state, and bearing well.

One thing we ought to develop, is the foreign trade in fresh cranberries and in the manufactured sauce. This belongs to the commercial tradesman, but the whole subject ought to be investigated and assistance rendered by our General Government wherever possible. This would add something to our export trade, and build up an industry remunerative to our people and harmful to no one.

Many varieties have been selected from the wild bogs, and are now cultivated and sold as are the plants of other fruits.

### PROPAGATING NUT TREES.

The art of budding and grafting nut trees as practiced by nearly all persons is attended with many failures. Even in the hands of the most intelligent and skillful, it is no easy task. Just why this is so neither the scientist nor the practical operator may be able to say, but the fact remains a hindrance to those who wish to propagate the choice varieties of nuts, which is the only sure way to perpetuate the character of the fruit.

One plan which is found to work by some persons in the hickory, pecan, and some species of the walnut (*Juglans*) is what is called ring-budding. It is done in June when the bark "runs" or peels easily. Take cions from the size of a lead pencil to half an inch or more in diameter, with good healthy but dormant buds. From this cion take off a ring of bark from 1 to 2 inches long, including a strong, well-developed bud, using great care to in no wise bruise or even touch its inside surface. The branch or little seedling to be operated upon should be as near the same size of the cion as possible. Cut it back to a stump, and from this take out a ring of bark of exactly the same length as the one to be inserted. The ring from the cion is carefully split and placed on the stock, being sure that the split edges and the upper and lower ends join exactly. To do this and make the bark and wood fit closely, it may be necessary to take off a small strip of the bark from the edge of the ring. The greatest care must be used to have the work done neatly and quickly, lest the tender surfaces of the cambium are injured by rough handling or by long exposure to the air. Bind the whole securely with waxed cloth, leaving out the bud only. Some say to cover the whole, stump and all, with a paper sack until the union is perfected, tying it below the wound. Others think the cutting away of the top is not best until after the bud has "taken." If the work is not done in the best manner it will not be worth while to do it at all.

Common cleft grafting is also practiced, and other methods of grafting, too, both on small stocks at the surface of the ground and top-working. E. B. Engle & Son, of Marietta, Pa., have usually practiced cleft grafting on the chestnut with success. They find little difference whether the cions are cut in fall or spring. They have been quite successful with cions cut in the grafting season and

put on at once, even so late that the buds had swollen some. The waxing was done in the common way.

Others think that cutting the cions in the fall, and keeping them lying on the ground with just enough covering of leaves or other loose material to prevent evaporation until late in the spring, is quite essential, thus retarding their growth until the sap starts in the stocks.

Reports of experiments with all these methods are earnestly desired.

#### REMARKS.

In addition to the foregoing described varieties of fruits there have been received at this office hundreds of packages, varying in size and amount from one specimen to a barrellful containing many varieties. I wish to acknowledge the deep interest in the work of this division that has been manifested by thousands of fruit-growers of the country, who have sent specimens and information of a pomological nature. The above-mentioned packages contained fruits of almost every kind known to this country, from the banana, mango, sapodilla, date, and lemon of the most southern regions, to the crab-apple, the dwarf blueberry, and cranberry of the north. Alaska and several foreign countries have also contributed. It is highly gratifying to have such hearty co-operation in my efforts to serve the cause of pomology. It is moreover a matter of extreme gratification to me to have had many official demonstrations of your own interest in this work, and I sincerely trust that whatever has been done or may yet be done by this division shall result in the advancement of the interests of those who are producing and consuming our fruits.

Obediently yours,

H. E. VAN DEMAN,  
*Pomologist.*

Hon. NORMAN J. COLMAN,  
*Commissioner of Agriculture.*

---

#### PEACH CULTURE IN THE EXTREME SOUTHWEST.

[Report of G. Onderdonk, special agent, U. S. Department of Agriculture, Division of Pomology.]

SIR: In submitting my report concerning the pomological interests of the Southwest it seems needful to present a preliminary statement of distinctions required in dealing with the fruit interests of not only the Southwest but of the extreme South generally.

While the farmers of every section have recognized the fact that certain crops are adapted to certain zones, and even that certain varieties in each general class of products are inexorably confined to limits presenting the required special conditions, yet it is marvelous to behold to what extent the pomologists of the United States have practically ignored this principle in its application to their work, thus entailing upon themselves and those dependent upon them in various relations losses so ruinous in extent and multiplied in variety of character. It has been too largely assumed that in the planting and care of the different fruits it was only necessary to decide what *variety* was desired in order to suit the purpose of the planter, and then to plant that chosen variety, without reference to climatic conditions. This is a great mistake.

Applying this thought to fruit culture, we observe that our people of every latitude have acted too much upon the supposition that they have only to determine the variety of peach desired and then plant that variety, regardless of the zone in which it is situated, and utterly ignoring the thought that there are different classes of the great peach family, each belonging by nature to its own isothermal zone, and refusing to remunerate the care bestowed upon it when subjected to the conditions of an unfriendly climate. And nowhere has this mistake proven more disastrous



than in the extreme South and Southwest. Observation and the dearest of all teachers, experience, teaches that while the fruits may be subjected to largely varied conditions, yet the stern hand of nature has fixed her bounds, beyond which human persistence can not force its way.

We are compelled to recognize that there are not only special strains of peaches, but that there are distinctions more obstinate than those of mere strain, which we can hardly define without the use of a term no less comprehensive than the designation of *race*. While we may deprecate the multiplication of distinction and the interests of peach culture in the higher latitudes have not required an observance of the distinctions of *race*, because only a single race has been comprehended there in the entire range of peach culture, yet when we come to investigate the peach in lower latitudes, nature forces her classifications upon us with a perseverance that admits of no denial.

We are aware that our declaration of several types of peaches so distinct as to be entitled to the designation of the races will be met with criticism by some more Northern minds. But in the extreme South, where different races come into part competition, the necessity of recognizing the distinctions made by the hand of nature is forced upon men of practical experience. Nature seems to have assigned to each race special conditions, and therefore special zones. We find that while a single race (the Persian) occupies the northern extreme, and another race (the Peento) occupies the southern extreme of the general fruit zone, yet the intermediate zones of the different races so overlap each other that in some cases two or more different races are found successful upon ground common to each other.

In defining the different races it is quite impossible to avoid the use of terms that are not more or less arbitrary. And yet we must have names to identify things. Should we employ any names in our designations of the races of the peach that are illy applied we shall be glad to have them substituted by designations more fitting.

#### THE PERSIAN RACE.

This race includes all varieties springing from the importation from Persia to Italy during the reign of the Emperor Claudius, which was introduced into Great Britain about 1550, and to the American colonies about 1680. They are all late bloomers and can not carry their foliage through the growing season of the southern portion of the belt in which they are cultivated.\* This race includes the varieties usually propagated in the northern nurseries and composes the bulk of the northern orchards. By designating this race of peaches as Persian there is no intimation that *all* peaches are not of primal Asiatic origin. But as the history of this race is universally conceded, there can be no question of the propriety of giving it a name referring it to the country of its origin.

We refer to the accompanying diagram, representing the relative position of the different races with reference to the isothermal lines. In Texas this race seems successful as far down as Palestine and at some elevated points below. The identification of the isothermal lines bounding these various zones would be a matter of practical interest to our people.

#### THE NORTHERN CHINESE RACE.

This race, as far as we have become acquainted with it, consists of the Chinese Cling and its numerous progeny. It does not seem to exist in great perfection in the northern portion of the general peach zone. It attains its greatest perfection in the latitude of northern Texas, and flourishes nearer the coast of Texas than the Persian varieties. It succeeds well as far southward as Austin, while below that point it diminishes in productiveness and longevity till a little below Gonzales; most of its varieties become worthless. We would expect it to succeed everywhere in the zone corresponding with the one indicated by the places in Texas which we have named. Some of its varieties (notably the Thurber) creep still farther south under the influence of a moist atmosphere. It might be remarked here that there are found to be notable instances in which a humid atmosphere causes fruits to flourish below what would otherwise have been their limit.

The Northern Chinese race is remarkable for the great size of its fruit, as well as the peculiar almond-like appearance of its foliage, so peculiar also to the Southern Chinese race of peaches. Judging from what we can see of the Chinese peaches in the United States, we might conclude that there is quite as much contrast in China between their northern and southern types as we can observe in the great peach belt of our country.

## THE SPANISH RACE.

We have been calling this race Spanish because we could not trace its history with any certainty farther than Spain. It appears to have been introduced from Spain to Mexico some two hundred and fifty years ago by the Catholic missionaries. It seems to have come to Florida in a similar way. It has been so long cultivated from seed in southern climates that it has become developed into a distinct race. The varieties of this race are mostly early bloomers, and they continue to grow throughout the long Southern season till interrupted by the comparative cold of our winters. This race has become widely scattered in the Gulf States and constitutes a hardy race of seedlings which have become the foundation of many choice varieties, corresponding closely in quality and appearance of fruit with some of the standard varieties of the Persian race. Prior to the introduction of the southern Chinese race into the extreme South, the Spanish race supplied the only possibility of successful peach orchards in the east region of the Gulf. The relative isothermal position of this race will be seen by reference to the accompanying diagram.

## THE SOUTHERN CHINESE RACE.

This race, as far as it is now represented in the United States, consists of the Honey peach and its progeny. Mr. Charles Downing, of New York, obtained some seed from China, and the original Honey tree seems to have been the only result of this lot of seed. The high latitude in which Mr. Downing lived was so unfavorable to the race that the original tree never fruited. But a budded tree was given to Mr. Henry Lyons, of Columbia, S. C., about 1855. The variety was placed in the hands of Mr. P. J. Berckmans, of Augusta, Ga., and the entire stock was held by him until 1858, when it was sent out for the first time; but it was not of superior value at Augusta, being still above its proper zone. When it was tried in Florida and in southern Texas it was found to be of very special merit; it ripens a little before the Tillotson. Several seedlings have been produced from it of special value to the extreme South, where the early varieties of the Persian race range from uncertain to impossible, according to the thermal conditions of the locality. This race supplies our hardest trees in the coast country of Texas and will always bear well, however mild the preceding winter. This race is not valuable in extreme north Texas. I have not obtained its proper northern limit, but have represented its zone on the diagram as falling a little short of that of the Persian race.

## THE PEEN-TO RACE.

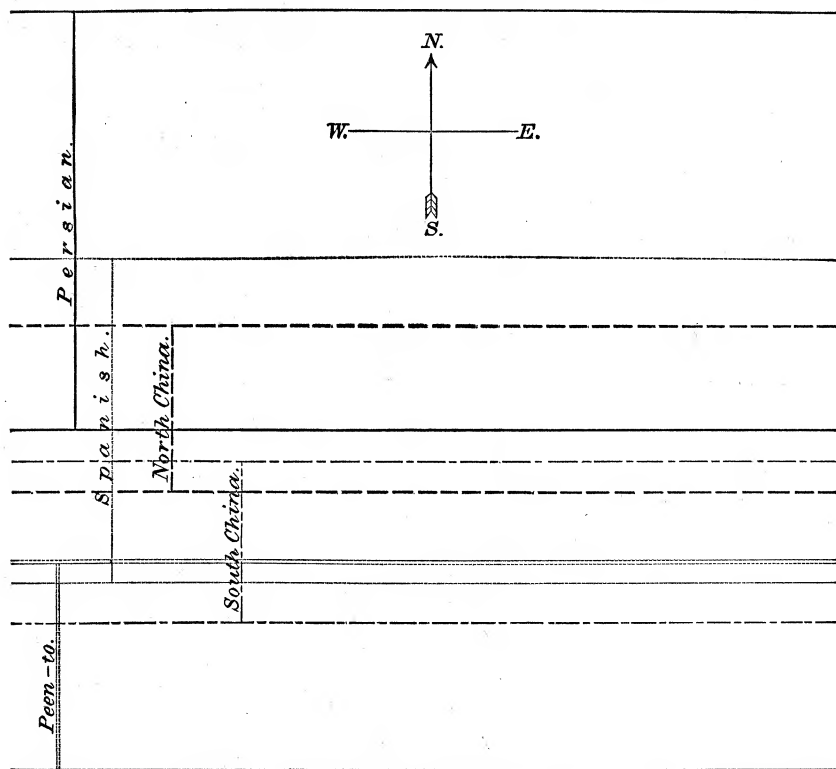
This race was introduced by Mr. P. J. Berckmans, of Augusta, Ga. He imported the pits from Australia in 1859. It was found worthless at Augusta, being above its proper zone; but it has been found of decided value in Florida. In the coast region of Texas generally the fruit of the Peen-to is mostly lost on account of its extremely early blooming. In southern Louisiana and in our extreme Southwest, at Brownsville, Tex., it promises better and may be found valuable. In general terms, I should say, after watching the Peen-to for a number of years, that in southern Texas generally this race is yet too far north to be successful, and belongs below the isothermal lines of 70°. Several seedlings of this race have been obtained which seem to be of great value only when far enough south to be in an orange-growing country. In fact, it would be interesting to see how far south of the zone of any other type this race might flourish.

There are some hybrids between the Peen-to and south Chinese type which promise highly. This race will undoubtedly prove to be a tropical type of peaches, fully at home among the oranges, lemons, bananas, pine-apples, guavas, and cocoa-nuts.

## SUPPLEMENTARY.

A survey of the limits of the different zones embraced in our general peach belt presents to the mind the interesting conclusion that, if the proper races are selected as material, peach culture is possible in every latitude of our great country, from the Great Lakes to our extreme Southern limits,

Chart showing relative situation of the zones of the different races of peaches in the United States.



### GRAPE CULTURE.

My observations upon the subject of grape culture in the extreme Southwest have extended through a period of thirty years. I have planted of every family of grapes known to our horticulturists, and carefully watched the results. I have closely observed the plantings of others, and the comparisons which I have been able to make during the present year have added confirmation to the generalizations that have been developing for some years.

Nothing seems more certain than the fact that generalizations governing the location of the different races of the peach have a parallel in viticulture. Yet it seems that the modifications resulting from variations in the degree of humidity are more marked in grape culture.

During my investigations of the present year I visited the vineyard of Mr. Hatch, at Ingleside, near Corpus Christi, Tex. While no variety of *V. labrusca* or *V. rotundifolia* has been of any considerable duration anywhere in the general region, it being the zone of the Herbemont type and *V. candicans*, yet I there saw different varieties of *V. labrusca* and various hybrids, all growing in the utmost perfection among those of the Herbemont type. A single Scuppernong covered a space of not less than 3,000 feet and in full bearing. Mr. Hatch's vineyard is situated upon a peninsula, with some miles of water on three sides, and the Gulf also supplying vapor for the region. The entire site is composed of sand to a great depth, perhaps 30 feet. The success of these varieties may probably be attributed to modifications by the humidity of the local atmosphere, as the same varieties failed in similar soil at other places.

In the vineyards of Corpus Christi, the soils varying, there was a general sameness of results in reference to the classes of grapes. In the vineyard of Mr. John

McCampbell, 2 miles back of Corpus Christi, on elevated ground, where inland influences prevail the varieties of *V. labrusca* were a failure. His best success is with varieties of the Herbemont type. In all of these vineyards there are several varieties of *V. vinifera* growing in great luxuriance and productiveness. Unfortunately few cultivators have a correct nomenclature for their grapes. There seems to be no phylloxera in that region.

In the vineyard of Mr. Hatch at Ingleside the *V. vinifera* are said to ripen well on an average of about every alternate year. Of the remaining crops the loss from rot varies from 20 per cent. to total, while under more inland influences the rot is less severe. The decay seems to depend upon the amount of dew or rain during the ripening season.

It is interesting to note that the very loose sand of Ingleside is such that phylloxera can not work in it, and therefore a whole section of about 25 square miles may be expected to be always proof against phylloxera. The bearing of this fact upon the value of the locality for the production of raisins is interesting to the country, as phylloxera will no doubt finally infest every soil of the country suited to their presence. It is also an encouraging reflection that the varieties of *V. vinifera* that may be found generally suited to the climate can probably be preserved upon stocks of the *V. rupestris*, which is indigenous to portions of Texas.

At Point Isabella and Brownsville, varieties of the European type were formerly successful. But now these varieties are all either dead or in a dying condition in every case which I could find, while Lenoir and Herbemont (both proof against phylloxera) flourish in perfection. It was inferred from appearances that the *V. vinifera* died from phylloxera, but I did not have lenses to investigate closely. At Matamoras the same state of grape culture exists.

At Laredo, Tex., I examined many plantations of grapes. I found *V. vinifera* varieties composing the bulk of the plantings there. The few plantings of Herbemont type were entirely promising. The growth of these two classes is vigorous and the plants productive. There appeared no evidence of phylloxera at Laredo. This is a high region with the atmospheric condition of the arid country around it.

*V. vinifera* and Herbemont types represent all of the successful plantings at Laredo. I saw many plantings of different types, which were evident failures.

Whatever may in the future be supplied to southwestern Texas from combinations between indigenous classes or classes that may prove adapted it is very plain that, aside from varieties of the *V. vinifera* and Herbemont types, we have nothing now that will give success in the extreme Southwest except under local conditions. The Herbemont and Lenoir, both of which are purely wine grapes, seem better adapted and harder than any other varieties. In fact these varieties succeed in the utmost perfection and make of nearly the entire State of Texas a natural wine-producing region of enormous capacity, if it should ever be developed in that direction. Of these two varieties the Lenoir attains its greatest success in the southwest, and will probably not prove successful in northern Texas, while the Herbemont region seems to cover the entire State. There are a number of new seedlings of this type, also others of various combinations now on trial, which present possibilities of vast service in the future.

Respectfully Submitted,

G. ONDERDONK,  
Special Agent.

Hon. NORMAN J. COLMAN,  
Commissioner of Agriculture.



KELSEY.



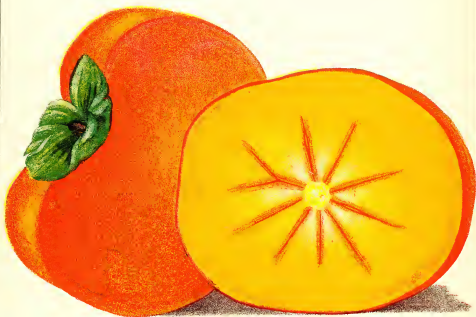
SATSUMA.



HACHIYA.



TANE-NASHI.



YEMON.





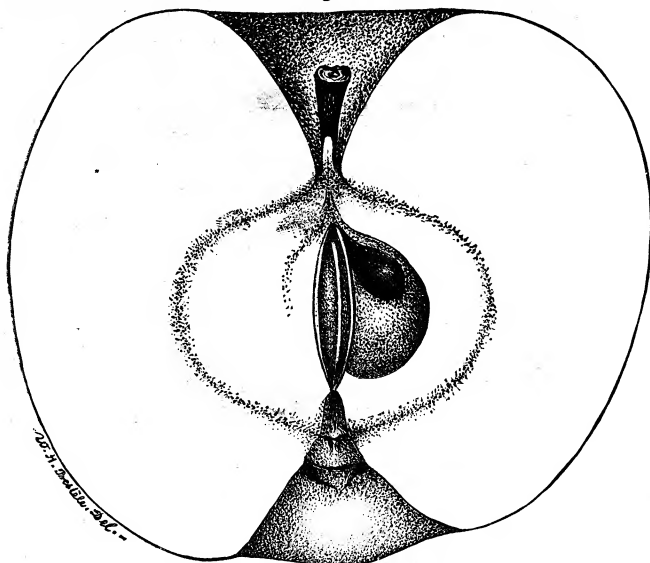


SATSUMA

Synonym Unshiu or Oonshiu

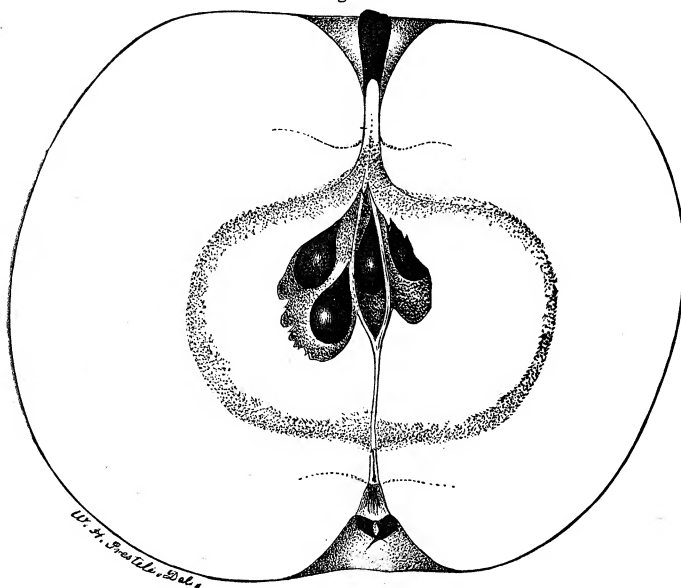


Fig. 1.



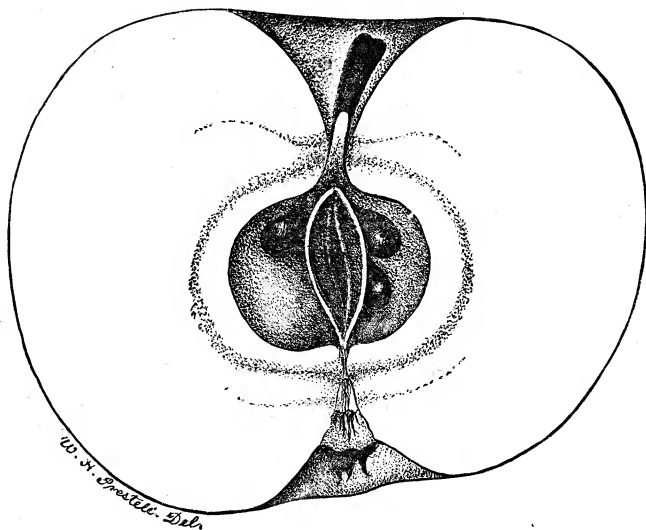
OZARK.

Fig. 2.



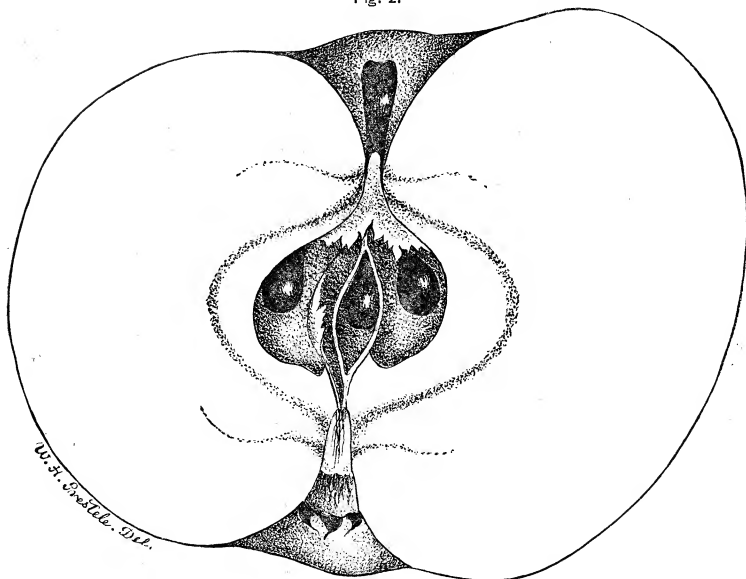
BELLA.

Fig. 1.



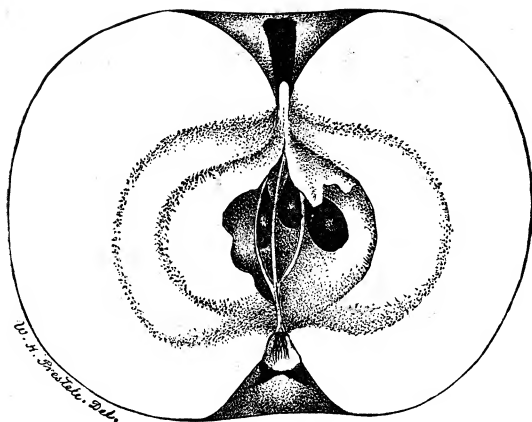
STAR.

Fig. 2.



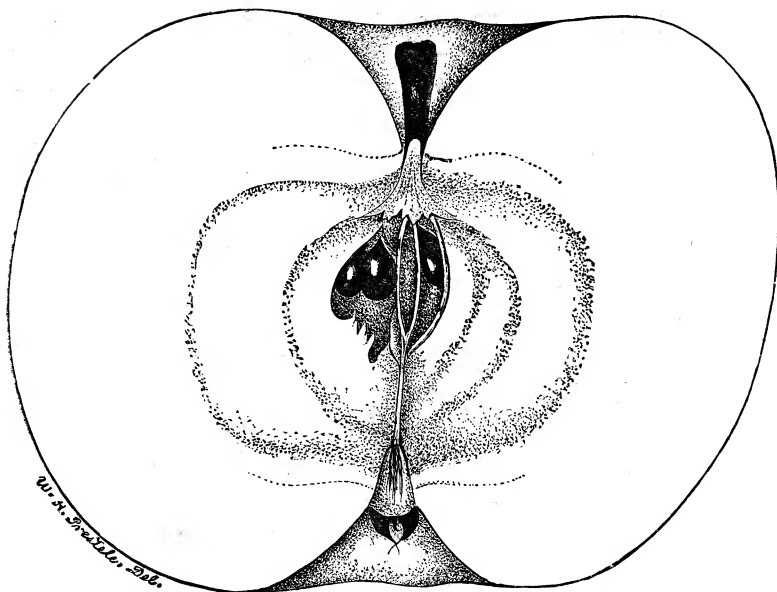
HUNTSMAN.

Fig. 1.



HARBOUR.

Fig. 2.



ORANGE WINTER.



